

CLAIMS:

1. A vessel for drying organic waste, the vessel comprising at least two elongate channels, each channel having a length
5 and a substantially segment shaped cross section, with a radius of between 0.25m and 0.75m.
2. A vessel according to claim 1 wherein the radius is between 0.3m and 0.6m.
- 10 3. A vessel according to claim 2 wherein the radius is 0.4m.
4. A vessel according to any one of the preceding claims
15 wherein the length of each channel is between 3m and 4m.
5. A vessel according to claim 4 wherein the length of each channel is 3m.
- 20 6. A vessel according to any one of the preceding claims comprising four channels.
7. A vessel according to any one of claims 1 to 5 comprising eight channels.
- 25 8. A vessel according to any one of claims 1 to 5 comprising twelve channels.
9. A vessel as hereinbefore described with reference to
30 Figure 2.
10. Apparatus for drying organic waste comprising:

a first vessel according to any one of claims 1 to 9,
for mixing and heating the organic waste to form an organic
paste;

means for adding the organic paste to a first organic
5 powder to form a mixture;

a second vessel according to any one of claims 1 to 9,
for mixing and heating the mixture to form a second organic
powder; and

means for controlling the rate of addition of the
10 organic paste to the first organic powder, such that the
resulting mixture is substantially in powder form.

11. Apparatus for drying organic waste comprising:

a vessel according to any one of claims 1 to 9, for
15 mixing and heating a first quantity of organic waste to form
an organic powder;

a conversion unit for converting a portion of the
organic powder to generate heat for heating a second quantity
of organic waste.

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12. Apparatus according to claim 11 wherein the conversion
unit is a combustion unit for burning the portion of the
organic powder.

25 13. Apparatus according to claim 11 or claim 12 further
comprising a heat exchanger, the heat exchanger using the
heat generated by the conversion unit to heat the vessel.

14. Apparatus according to claim 13 wherein the heat
30 exchanger circulates hot gas beneath the vessel.

15. A vessel for drying organic waste, the vessel comprising:

at least two elongate adjacent channels, each channel having a length and a substantially segment shaped cross-section;

an axle associated with each channel, each axle mounted for rotation about an axis parallel to the length of its respective channel, each axle mounting a plurality of mixing paddles or one or more helical blades;

an interface between the two channels; and

a first heater for heating the channels, wherein, during drying, the axles associated with adjacent channels are arranged to rotate in opposite directions and the interface between adjacent channels is heated so as to enhance breakdown of the organic waste at the interface.

16. A vessel according to claim 15 wherein the interface is heated by the first heater.

17. A vessel according to claim 15 wherein the interface is heated by a second heater.

18. A vessel according to any one of claims 15 to 17 wherein the radius of the cross-section of each channel is between 0.25m and 0.75m.

19. A vessel according to claim 18 wherein the radius is between 0.3m and 0.6m.

20. A vessel according to claim 19 wherein the radius is 0.4m.

21. A vessel according to any one of claims 15 to 21 wherein the length of each channel is between 3m and 4m.

22. A vessel according to claim 21 wherein the length of each channel is 3m.

5 23. A vessel according to any one of claims 15 to 21 comprising four channels.

24. A vessel according to any one of claims 15 to 21 comprising eight channels.

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25. A vessel according to any one of claims 15 to 21 comprising twelve channels.

26. Apparatus for drying organic waste comprising:

15 a first vessel according to any one of claims 15 to 25, for mixing and heating the organic waste to form an organic paste;

means for adding the organic paste to a first organic powder to form a mixture;

20 a second vessel according to any one of claims 15 to 25 for mixing and heating the mixture to form a second organic powder; and

means for controlling the rate of addition of the organic paste to the first organic powder, such that the
25 resulting mixture is substantially in powder form.

27. Apparatus for drying organic waste comprising:

a vessel according to any one of claims 15 to 25, for mixing and heating a first quantity of organic waste to form
30 an organic powder;

a conversion unit for converting a portion of the organic powder to generate heat for heating a second quantity of organic waste.

28. Apparatus according to claim 27 wherein the conversion unit is a combustion unit for burning the portion of the organic powder.

5 29. Apparatus according to claim 27 or claim 28 further comprising a heat exchanger, the heat exchanger using the heat generated by the conversion unit to heat the vessel.

10 30. Apparatus according to claim 29 wherein the heat exchanger circulates hot gas beneath the vessel.

31. A method for drying organic waste, comprising the steps of:

15 mixing and heating the organic waste to form an organic paste; then

adding the organic paste to a first organic powder to form a mixture and mixing and heating the mixture,

20 wherein the rate of addition of the organic paste to the first organic powder is such that the resulting mixture is substantially in powder form.

32. A method according to claim 31 wherein the organic waste has a water content of more than about 40% by weight.

25 33. A method according to claim 31 or claim 32 wherein the organic paste has a water content of between about 20% and about 30% by weight.

30 34. A method according to any one of claims 31 to 33 wherein the first organic powder has a water content of less than about 10% by weight.

35. A method according to any one of claims 31 to 34 further comprising the step of further mixing and heating the mixture to form a second organic powder.

5 36. A method according to claim 35 wherein the second organic powder has a water content of about 10% by weight.

37. A method according to any one of claims 31 to 36 further comprising the preliminary step of drying organic waste to
10 form the first organic powder.

38. A method according to claim 37 wherein the step of drying organic waste to form the first organic powder is done by mixing and heating the organic waste.

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39. Apparatus for drying organic waste comprising:

a first vessel for mixing and heating the organic waste to form an organic paste;

means for adding the organic paste to a first organic
20 powder to form a mixture;

a second vessel for mixing and heating the mixture to form a second organic powder; and

means for controlling the rate of addition of the organic paste to the first organic powder, such that the
25 resulting mixture is substantially in powder form.

40. Apparatus according to claim 39 wherein the organic waste has a water content of more than about 40% by weight.

30 41. Apparatus according to claim 39 or claim 40 wherein the organic paste has a water content of between about 20% and about 30% by weight.

42. Apparatus according to any one of claims 39 to 41 wherein the first organic powder has a water content of less than about 10% by weight.

5 43. Apparatus according to any one of claims 39 to 42 wherein the second organic powder has a water content of about 10% by weight.

44. Apparatus according to any one of claims 39 to 43
10 wherein the first vessel comprises:
at least two elongate channels, each channel having a length and a substantially segment shaped cross-section;
an axle associated with each channel, each axle mounted for rotation about an axis parallel to the length of its
15 respective channel, each axle mounting a plurality of mixing paddles or one or more helical blades; and
a heater for heating the channels.

45. Apparatus according to any one of claims 39 to 44 wherein
20 the second vessel comprises:
at least two elongate channels, each channel having a length and a substantially segment shaped cross-section;
an axle associated with each channel, each axle mounted for rotation about an axis parallel to the length of its
25 respective channel, each axle mounting a plurality of mixing paddles or one or more helical blades; and
a heater for heating the channels.

46. Apparatus according to any one of claims 39 to 45
30 wherein the first vessel comprises a vessel according to any one of claims 1 to 20.

47. Apparatus according to any one of claims 39 to 46 wherein the second vessel comprises a vessel according to any one of claims 1 to 20.
- 5 48. Apparatus for drying organic waste according to the method of any one of claims 31 to 38.
49. A method for drying organic waste, comprising the steps of:
- 10 mixing and heating a first quantity of organic waste to form an organic powder;
converting a portion of the organic powder to heat a second quantity of organic waste.
- 15 50. A method according to claim 49 wherein the step of converting a portion of the organic powder comprises burning a portion of the organic powder.
51. A method according to claim 49 or claim 30 wherein the
20 method is carried out as a step by step process.
52. A method according to claim 49 or claim 50 wherein the method is carried out as a continuous process.
- 25 53. A method according to any one of claims 49 to 52 wherein the organic waste has a water content of more than about 40% by weight.
54. A method according to any one of claims 49 to 53 wherein
30 the organic powder has a water content of about 10% by weight.
55. Apparatus for drying organic waste comprising:

a vessel for mixing and heating a first quantity of organic waste to form an organic powder;

a conversion unit for converting a portion of the organic powder to generate heat for heating a second quantity
5 of organic waste.

56. Apparatus according to claim 55 wherein the conversion unit is a combustion unit for burning the portion of the organic powder.

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57. Apparatus according to claim 55 or claim 56 further comprising a heat exchanger, the heat exchanger using the heat generated by the conversion unit to heat the vessel.

15 58. Apparatus according to claim 57 wherein the heat exchanger circulates hot gas beneath the vessel.

59. Apparatus according to any one of claims 55 to 58 wherein the organic waste has a water content of more than
20 about 40% by weight.

60. Apparatus according to any one of claims 55 to 59 wherein the organic powder has a water content of about 10% by weight.

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61. Apparatus according to any one of claims 55 to 60 wherein the vessel comprises:

at least two elongate channels, each channel having a length and a substantially segment shaped cross-section; and

30 an axle associated with each channel, each axle mounted for rotation about an axis parallel to the length of its respective channel, each axle mounting a plurality of mixing paddles or one or more helical blades.

62. Apparatus according to any one of claims 55 to 61 wherein the vessel comprises a vessel according to any one of claims 1 to 20.

5 63. Apparatus for drying organic waste according to the method of any one of claims 31 to 38.

64. Apparatus for drying organic waste according to the method of any one of claims 49 to 54.